2016

Trading Traditions: Continuity, Innovation and Resource Use of Forest Fibers Among the Ye'kwana and Ayoréode

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The challenge of contemporary tropical forest conservation is to maximize community development while minimizing harvest impact on forest resources; to encourage indigenous participation in the research and development process; to insure the sustainability of both the resource and the enterprise; and to add value to forest products at the local level. From this broad conservation objective, non-timber forest products (NTFPs) emerged in the 1980s and 1990s as the forest enterprise that might be less environmentally destructive than timber extraction, cattle ranching, and cash crop agriculture, and contribute to rural livelihoods and conservation. Since that time, these concepts have been both widely promoted and challenged.[3][4] Numerous obstacles to a positive outcome exist at the local level including a) linking products to market; b) inability to profit from sales while sustaining harvests; c) lack of appropriate business skill and sufficient capital to overcome fluctuating markets or trends.[5] Additional constraints are low target species abundance, often long arduous journeys deep into the forest,[6] and high transport costs to reach markets including local markets, which may not be profitable.[7]

The Ayoréode (plural for Ayoreo, but we will use Ayoreo for simplification) of Bolivia and Paraguay and the Ye'kwana of Venezuela and Brazil have been hunting and harvesting in vastly different ecological zones in South America for centuries – the Ayoreo from the dry tropical forests of the Chaco of Bolivia and Paraguay and the Ye'kwana from rain forests of southern Venezuela. Each group has intimate knowledge of the plant resources required for subsistence and survival, and these plants fulfill a functional, ceremonial, and even spiritual role in each society. We focused on the forest fibers with strong cultural components.

We explore the rich basket and fiber weaving traditions of the Ayoreo and Ye'kwana with emphasis on two plant species that have persisted, even as the cultures themselves have changed, and the women's innovations of products made with these fibers. We compare historical events, ethnobotany, processing and products, sustainability strategies, markets and challenges. Elements of the two projects address some of the above-stated obstacles and may contribute to positive outcomes, while recognizing government policies, devastating economic and destructive environmental policies that exist in these countries may lead to an eventual failure.

[1] President, Earth Bound, Inc. (501c3) USA
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[3] Bruce Hoffman, "Biology and Use of Nibbi *Heteropsis flexuosa* (Araceae): the Source of an Aerial Root Product in Guyana" (M.S. Thesis, Florida International University, Miami FL, 1997).
[4] Brian Belcher and Kathrin Schreckenberg, "Commercialisation of Non-timber Forest Products: a Reality Check," *Development Policy Review* 25 (3), (2009):355-377.
[5] Maria Paula Balcázar Vargas and Tinde van Andel, "The Use of Hemiepiphytes as Craft Fibres by Indigenous Communities in the Colombian Amazon," *Ethnobotany Research & Applications* 3 (2005):243.
[6] Jason Clay, "Some General Principles and Strategies for Developing Markets in North America and Europe for Non-timber forest products," In *Sustainable Harvest and Marketing of Rain Forest Products.* Edited by Mark Plotkin and Lisa Famolare. (Washington: Island Press 1992), 302-309.
[7] Adrian C. Newton, Elaine Marshall, Kate Schreckenberg, "Commercialisation of Non-timber Forest Products: Analysis of the Factors Influencing Success*" International Forestry Review* 5 (2002):128-137.

Figure 1. Map of location of Ayoreo and Ye'kwana communities in Bolivia and Paraguay including the Ayoreo communities (in the lower right) and records of uncontacted Ayoreo in the shaded areas; Ye'kwana population in the Caura river basin of Southern Venezuela. Uncontacted Ayoreo locations from Union de Nativos Ayoreo de Paraguay (UNAP)[8];Ayoreo settlement locations from Heijdra[9]; Ye'kwana settlement locations from USGS Harvest Data. Map prepared by Ken McMurry

Figure. 2.(left) Ancestral home of the Ayoreo in the Chaco Dry Tropical Forest, Bolivia and Paraguay, Photo E. Uzquiano; (right) Ye'kwana home in tropical rain forest along the Caura River, Southern Venezuela). Photo L.Wilkins

[8] *El Caso Ayoreo Paraguay*, Informe IWGIA 4, Unión de Nativos Ayoreo de Paraguay (UNAP), Iniciativa Amotocodie (IA), Grupo Internacional de Trabajo Sobre Asuntos Indigenas (IWGIA), Copenhague, 2010.
[9] Hans Heijdra, "La Nueva Gente*" (*Thesis de Maestria*,* U. de Agronomia, Wageningen, 1987).

The Ayoreo of the Gran Chaco

The Ayoreo people are hunters and gatherers whose original territory in the Gran Chaco, a vast dry tropical forest, straddled the borderlands of Bolivia and Paraguay. Nomadic families harvest multiple wild species for food, medicines, and fibers from this arid tropical forest. An unknown number of isolated (uncontacted) groups remain in this vast but vanishing wilderness. In the past, the Ayoreo were organized into seven clans of varying size and power and were distributed in a complex array over the Chaco landscape. Each clan was known by specific (family) name that corresponds to the designs of the textiles they wore and used (see Fig. 6. below). (*Bromelia hieronymi)*, known as dajudie in the Ayoreo language or *garabatá fino* in Spanish, is legendary and notable for its many uses. Very fine but strong fibers are extracted from the leaves of this bromeliad and used in the construction of many items including, clothing, bedspreads, and many different types of bags used for harvesting, storage and hunted game. It is the ecology of this arid forest that produced the conditions for a tough drought-resistant plant. The fibers of dajudie are strong and flexible, a necessity for a hunting/gathering lifestyle.

Figure 3. (left) Dajudie (Bromelia hieronymi), a wild pineapple. Photo. E. Uzquiano; (right) Tujinamia Chiqueno scrapping a Dajudie leaf. Photo Z. Mendez.

Over the past 70 years, most of the Ayoreo had been forcibly moved from their tribal lands to small mission settlements, including Puesto Paz, the location of the Ayoreo women's cooperative Cheque Oitedie. These new lands lacked the valued dajudie, so important to women's work and culture. Women attempted to use inferior fibers, or took arduous trips back to their original forests to harvest wild dajudie.

Figure 4. (left) Large hunting bag (utebei) compared to modern market bag; (right) Traditional large (jubei) for moving camp.

Innovation by Cultivation

In 1997 people of Puesto Paz received a grant to investigate the ecology of dajudie; this eventually led to the transplant and cultivation of wild dajudie into now-settled communal forests. Cheque Oitedie Cooperative was formed in 2000. Over time, they improved management practices and harvesting techniques, and today there is a 3-hectare community farm, providing a reliable resource for the products they make today. Their model program has been replicated in other communities.

Since 2000, the community has conducted participatory workshops between artisans and academics to share knowledge on a variety of topics such as accounting, design, fair trade pricing, quality control, markets and marketing, partnership, communication, leadership. This is an on-going dialog as new challenges present themselves.

Figure 5. (left) Eida and Ique at dajudie garden in Puesto Paz; (right) Cheque Oitedie women after harvest of dajudie plants. Photos by Ines Hinojosa (left), E.Uzquiano (right).

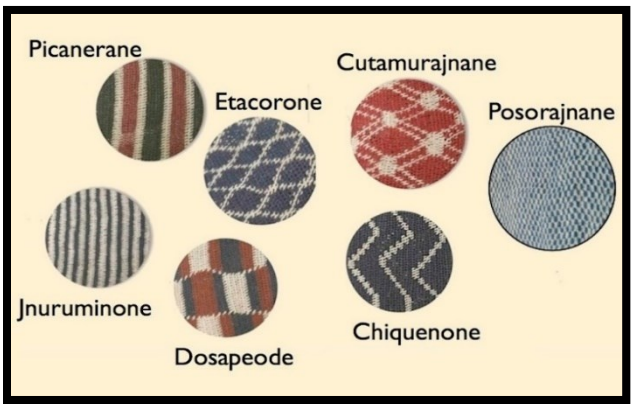

Figure 6. Original 7 Ayoreo designs. Illustration I. Hinojosa

Originally it was necessary for each of the 7 clans to identify itself by the traditional pattern of their bag to recognize even distant family relations. This was important, especially in times of conflicts. The designs represented different animals (the tail of a wild cat; the stripes of a lizard), abstract human designs, and other natural phenomena (clouds), all known as "edopasade," beings with a special relationship to their clan. Today, each family uses the traditional patterns interchangeably, and artisans continue to create new designs.

From Garden to Global Market

The garden plot of dajudie must be carefully maintained for three years before harvest. After the harvest (see Fig. 5), the spines on each leaf are first removed by hand, then the tough outer layer is removed using a machete. Fibers are then cleaned, dried and dyed, using some natural and some synthetic dyes. Ash from a termite mound helps to smooth the fibers, which are then twined together by rolling along the woman's thigh. The bag is created by a looping technique using a needle, while the fiber is attached to the artisan's foot for tension. The entire process including harvest and cleaning may take 6 to 8 weeks. Today, bags are made primarily for export markets because a medium bag will sell for $20 locally but $45-75 in the international marketplace.

Figure 8. Ique Ecatore, Santa Fe International Folk Art Market, New Mexico 2011. Shown are traditional and modern bags: blanket (left), two jubei traditional bags: a small (to the right of Ique's head) and the large red, black and white fan-shaped bag; far right large game bags; the other medium-sized bags are a mix of traditional and modern designs.

Figure 7. Ique Etacore demonstrating bag making

Ayoreo Discussion

The cultural value of dajudie *(Bromelia hieronymi*) among the Ayoreo, and the tenacity of artisans to develop the resource in their community of Puesto Paz, are two factors that contribute the successful management of this species in agricultural gardens. Although the business is not yet profitable in financial terms, it has had a positive social impact in the lives of Cheque Oitedie women.

The long-term support and partnership established with the Rainforest Fund gave the cooperative the opportunity to reach international markets, increase their operational funds, and increase prices to the artisans.

Cheque Oitedie cooperative achieved significant goals through this 17-year project. However, there are still many challenges: these include profitability, innovation, search for new markets, also the training of business leaders and continued skill development of all. Only the resilience of the Ayoreo women will keep their organization growing and successful.

The Ye'kwana – People of the River

The Ye'kwana inhabit several tributaries of the Orinoco River Basin in southern Venezuela and parts of Brazil. Numbering over 4000, they live in small villages along the shores of rivers, where they hunt, fish and farm. They are known as the "people of the river" because of their exceptional ability to carve canoes and navigate the rivers. Basketry is an intricate part of daily life, and men and women weave more than 30 functional and ceremonial baskets (Knap-Visbo 1998).[10] Especially well known are the men's traditional ceremonial baskets, the Painted Waja (twill plaited basket), ceremonial baskets with iconography that portrays complex legends of creation and migration that have been studied and described by David Guss.[11] Once hunters and gatherers, interactions with missionaries changed settlement patterns, and families eventually formed the first permanent settlement called Santa Maria de Erebato, which included a school and a medical outpost. It eventually gave rise to other smaller settlements along the river. One of these is Boca de Nichare (mouth of Nichare). It is in this village that the project described here began in 2001 inspired by Aurora Rodriguez, a basket artisan, leader in this community, and founder of Kanwasumi Basket Cooperative.

Figure 9. (left) Traditional village;(right) Rivers provide the only means of travel to villages and harvesting/hunting sites.

Men and women make many different traditional baskets that reflect traditional subsistence activities and their role in society. Among the best known are the Wuwa – the women's burden basket and the men's Painted Waja. Shown here is one of many waja designs reflecting the traditional beliefs of the Ye'kwana. The men's waja is disappearing today, but the designs persist in the women's baskets.

Figure 10. Washidi (spider monkey)

Evolution of the Wuwa

The Wuwa is a woman's traditional burden basket that is heavily reinforced to carry loads of up to 80-100 lbs. A second traditional basket is the setu, a rounded storage basket. The baskets are made with several species of hemi-epiphyte, collectively called minñatö *(Heteropsis spp.)*. It is one of a group of plants whose aerial roots are important resources for subsistence, crafts, and commercial use by rural and indigenous inhabitants of many South American forests.[12]

[10] Claudia Knab-Visbo, "A Rainforest in the Caura Reserve (Venezuela) and its Use by the Indigenous Ye'kwana People" (Ph.d.diss., U. of Wisconsin, Madison, 1997).
[11] David Guss, "To Weave and Sing: Art, Symbol, and Narrative in the South American Rain Forest," (Berkley: U. of California Press, 1989), 79-85.
[12] Balcazar-Vargas and van Andel, "Use of Hemiepiphytes, 2005.

Innovation by Design

Encouraged by missionaries many years ago, Ye'kwana women began to transform their traditional baskets to finer more delicate versions for sale to tourists. Today, they are woven in many sizes, colored with natural dyes, and they are decorated with the mythical figures of Ye'kwana legend, which are those originally woven into men's waja baskets. A second cooperative called Medewa, 60+ women from Santa Maria de Erebato joined the project in 2007. Women have attended the International Folk Art Market from 2006 to 2015, and the baskets have become favorites of the U.S. home décor market. The cooperatives organized participatory workshops in resource management, business development and markets in the communities.[13] Kanwasumi cooperative won 2nd place in a South American Enterprise competition.[14] The women continue to experiment with new colors and dyes, and a new artistry is evolving.

Figure 11. (left) Lucia Pacheco, Parupa village, Photo D. Guss 1982; (right) Clara Garcia from Santa Maria de Erebato weaving a contemporary basket, Photo E. Carlsson 2010.

Figure 12. (left) workshops shared information on technique, quality, sizing, design elements marketing; (right) Aurora Rodriquez representing Kanwasumi Basket Cooperative Santa Fe Folk Art Market 2011.

[13] Wendy Townsend, Memorias of workshops with theYe'kwana communities including: Introduction to the comericalization of Artesania(2002, 2005), Deseño de una investigación sobre el manejo de Minñatö (2003, 2007).
[14] Wendy Townsend, La participación Ye'kwana en Experiencia Viva 2, Iquitos, Peru (2005), developed by PRAIA, El Programa Regional de Apoyo a los Pueblos Indigenas de la Cuenca del Amazonas.

Traditional wuwa Modern wuwa Traditional setu Modern setu

Figure 13. Comparison baskets. Wuwa photos by N. Day, setu photos by L. Wilkins and U.Florida photographer.

Minñatö, the Resource

Several species of *Heteropsis* yield fibers that are important resources along the Caura River of Southern Venezuela for use by indigenous and rural inhabitants.[15] Unprocessed aerial roots are used as the principal lashing material employed in the construction of traditional buildings. Processed fibers (dyed, scraped, and split) are the main materials used for basket weaving among the Ye'kwana. These baskets still play a central role in daily subsistence activities, but they also have become a major source of income for Ye'kwana women.[16] Aerial roots are also collected as raw material for the wicker furniture industry in many countries, including Venezuela, and may be threatened by over-exploitation throughout its range. The arial roots are mature when they reattach to the ground, and they are harvested by pulling them down in a certain way so they detach high in the tree. The study in Guyana by Hoffman found that the host plant will not be harmed if fewer than 50% of the roots are removed.[17]

Figure 14. (left) Heteropsis sp. is a hemi-epiphyte that germinates on the ground and climbs up a tree where it settles into a low branch and subsequently sends aerial roots down; (right) Aurora is shown here harvesting minñatö roots.

Considerable information exists on the ethnobotany, growth, harvesting limits, and conservation status *of Heteropsis spp*. throughout its range.[18] Surveys of women harvesters in Santa Maria show that opinions vary about the status of minñatö today relative to its abundance in the past, and there is some evidence that women from Medewa have modified both the location and

[15] Claudia Knab-Vispo, Judith Rosales, and Germán Rodriguez. "Observaciones Sobre el Uso de las Plantas por los Ye'kwana en el Bajo Caura," in *Ecologia de la Cuenca del Rio Caura, Venezuela II. Estudios Especiales*, edited by Otto Huber and Judith Rosales, *Scientiae Guaianae* 7(1997):215-257.
[16] Claudia Knab-Vispo, et al. "Ecological Observations on *Heteropsis Spp.* (Araceae) in Southern Venezuela," *Economic Botany* 57 (3), (2003): 345-353.
[17] Hoffman, "Biology and Use of Nibbi
[18] Reviewed in Knab-Vispo et al., "Ecological Observations"

timing of their harvesting to better manage their minñatö resources.[19] The long life cycle of 60+ years for *Heteropsis spp*. might preclude any planting or gardening of this genus. However, ecological research on the species and habitat preferences suggests there is potential for enrichment planting, particularly given its usefulness and earning potential to many different inhabitants of the region,[20] but there has been no real progress to date.

Discussion

The Earth Bound/Ye'kwana Project has been a cooperative effort for over 15 years within several Ye'kwana communities in the Caura region of Southern Venezuela. The initial objective was to share knowledge of the resources used for craft production, to explore the complex issues of sustaining those resources, develop a marketing plan and assist artisans, especially the women, in the development of a sustainable business. The project focused on the women's baskets because of their skill and innovation of new designs and because hemi-epiphytes might provide a suitable resource since the plant is not destroyed in the harvesting. Income to the women has increased along with favorable fair-trade markets. The major limitations have been the complex geography, resulting in long distance river travel and high costs for workshops, monitoring and for transporting baskets. Nevertheless, the market has sustained these costs. Within the last 7-10 years, the influx of illegal miners, the military, and mafias have created chaos, deforestation and pollution in the Ye'kwana territory, along with a failed economy. Recently, women from Medewa reported a large stand of minñatö had been stolen, so competition for these resources has increased. Together these conditions undermine the Ye'kwana traditional life style, and their future and that of neighboring tribes remains uncertain.

Conclusions

Over the past 30 years, migration, resettlement, and acculturation within both Ayoreo and Ye'kwana brought about changes in the basket and fiber weaving traditions of each group, placing a new emphasis on development and resource management. Artisans continue to rely on traditional methods and local resources, and women's cooperatives have been the main force for change as women develop innovative products and programs as a means of cultural and economic survival. There has been moderate success in reaching initial goals, but the domesticated groves of the Ayoreo, and the traditional lands of the Ye'kwana are threatened by outside pressures.

Acknowledgements

For Ayoreo Project: Enrique Uzquiano Perez, who established the standards of cultivation for *B. hieronymi*; Durasei Picanerai, Amonai Chiqueno, elder artisans and people of Puesto Paz, who shared their knowledge and more; Ms. Franca Sciuto, Rainforest Fund, for their confidence and support; Karen Gibbs, By Hand Consulting, for her encouragement to reach out to new markets.

For Ye'kwana Project: Aurora Rodriguez, Simon Caura & family for their commitment over many years; the women of Kanwasumi and Medewa cooperatives for their continued dedication to the project; PRAIA, Aid to Artisans for funding; Volunteers Amy Penfield, Carlton Pomeroy, Byron Real for your dedication without which we would not have been able to persevere; Erica Carlsson for your contributions and resilience over many years.

[19] Erica Carlsson, "Understanding Harvesting Species of the Genus *Heteropsis* and Basket Production by Indigenous Ye'kwana of the Orinoco Basin, Venezuela" (M.S. thesis, University of Florida, 2012).
[20] Knab-Visbo et al. "Ecological observations"

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